

CLAIMS

What is claimed is:

- 1        1. An energy transfer element, comprising:
  - 2            an energy transfer element core;
  - 3            a first winding wound around the energy transfer element core;
  - 4            a second winding wound around the energy transfer element core, the first
  - 5            winding capacitively coupled to the second winding;
  - 6            a third winding wound around the energy transfer element core, the third
  - 7            winding to generate a third winding electrostatic field to substantially cancel
  - 8            relative electrostatic fields generated by the first and second windings relative to
  - 9            the energy transfer element core to substantially reduce a capacitive displacement
  - 10          current between the first and second windings; and
  - 11            a fourth winding and a fifth winding wound around the energy transfer
  - 12          element core between the first and second windings to substantially reduce the
  - 13          capacitive displacement current between the first and second windings, the fourth
  - 14          winding coupled to the first winding and the fifth winding coupled to the second
  - 15          winding.
  
- 1        2. The energy transfer element of claim 1 wherein the first winding is an
- 2        input winding of the energy transfer element and the second winding is an output
- 3        winding of the energy transfer element.

1           3. The energy transfer element of claim 1 wherein the first winding is an  
2       output winding of the energy transfer element and the second winding is an input  
3       winding of the energy transfer element.

1           4. An energy transfer element, comprising:  
2       an energy transfer element core;  
3       a first winding wound around the energy transfer element core;  
4       a second winding wound around the energy transfer element core, the first  
5       and second windings capacitively coupled to electrical earth; and  
6       a third winding wound around the energy transfer element core and  
7       coupled to the first winding; and  
8       a fourth winding wound around the energy transfer element core and  
9       coupled to the second winding, the third winding and fourth winding to generate a  
10      third winding electrostatic field and a fourth winding electrostatic field to  
11      substantially reduce the capacitive displacement current between the first and  
12      second windings.

1           5. The energy transfer element of 4 comprising a fifth winding wound  
2       around the energy transfer element core and coupled to the first winding, the fifth  
3       winding wound to generate a fifth winding electrostatic field to cancel relative  
4       electrostatic fields generated by the first second third and fourth windings relative

5 to the energy transfer element core to substantially reduce a capacitive  
6 displacement current between the energy transfer element core and electrical  
7 earth.

1 6. The energy transfer element of 5 wherein the fifth winding is  
2 electrically coupled to the first winding.

1 7. The energy transfer element of 5 wherein the fifth winding is  
2 electrically coupled to the second winding.

1 8. The energy transfer element of claim 5 wherein the first winding  
2 capacitively is coupled to the second winding, wherein the fifth winding  
3 electrostatic field substantially cancels relative electrostatic fields generated by the  
4 first and second windings relative to the energy transfer element core to  
5 substantially reduce a capacitive displacement current between the first and  
6 second windings and the energy transfer element core.

1 9. The energy transfer element of claim 5 wherein the fifth winding is  
2 wound around the energy transfer element core with a number of turns based at  
3 least in part on a function of a percentage portion of the first winding included in a  
4 first layer of the first winding.

1        10. The energy transfer element of claim 5 wherein the first winding is  
2        physically wound closer to the energy transfer element core than the second  
3        winding.

1        11. The energy transfer element of claim 10 wherein the fifth winding is  
2        physically wound closer to the energy transfer element core than the first winding.

1        12. The energy transfer element of claim 10 wherein the first and second  
2        windings are physically wound closer to the energy transfer element core than the  
3        third winding.

1        13. The energy transfer element of claim 4 wherein the energy transfer  
2        element is included in a flyback transformer.

1        14. The energy transfer element of claim 4 wherein the energy transfer  
2        element is included in a forward converter transformer.

1        15. The energy transfer element of claim 4 wherein the first winding is an  
2        input winding of the energy transfer element and the second winding is an output  
3        winding of the energy transfer element.

1           16. The energy transfer element of claim 4 wherein the first winding is an  
2   output winding of the energy transfer element and the second winding is an input  
3   winding of the energy transfer element.

1           17. The energy transfer element of claim 4 wherein the energy transfer  
2   element is included in a power supply.